









## Overseas

OVERSEAS  
TEACHING POSTSLECTOR IN ENGLISH  
(YUGOSLAVIA)

University of Pristina. To teach English Language to students in the Department of English. Candidates—men only (single or married without children)—should have a degree in English or Modern Languages; TEFL qualification with phonetic component desirable. Salary 7,900 new Dinars per month (currently £1,353 p.m.) plus £1,353 p.m. paid by the British Council in the UK. Free accommodation. Starting date October 1978. One year contract, renewable. 78 UU 84

LECTOR IN ENGLISH FOR SPECIAL PURPOSES  
(YUGOSLAVIA)

University of Ljubljana. To teach Technical English to university students of science and technology. Degree and TEFL qualification essential, postgraduate qualification in linguistics desirable. Interest in or experience of materials production or ESP. Substantial experience of TEFL overseas essential and recording experience an advantage. Preliminary salary 6,000-7,000 new Dinars per month.

month net (present rate of exchange £1 equals ND 35) nonconvertible plus annual subsidy of £1,353 paid by the British Council in the UK. Benefits: Free medical services; employer's portion of superannuation if applicable. One year contract, renewable. 77 RU 149

ENGLISH LANGUAGE TEACHING  
ADVISED

## (THE GAMBIA)

Department of Education and Culture, Banjul, for December 1978 (or earlier). Duties include lecturing at teacher training college, syllabus and materials design, organizing in-service courses and running the English Teaching Information Centre. Qualifications: Degree from a British University, MA in Linguistics or one year postgraduate TEFL qualification and experience of teacher training in a developing country. Males candidates preferred. Salary: £5,891 to £7,707 p.m. plus 10 per cent Inducement. Benefits: Personal and children's accommodation; medical scheme; employer's share of superannuation. Two year KETL contract. 78 TE 12

Return fares are paid. Local contracts are guaranteed by the British Council. Please write briefly stating qualifications and length of appropriate experience, giving relevant references and number and address of post, for further details and application form to The British Council (Appointments), 85 Davies Street, London W1V 2AA.

## General Vacancies continued

leaa INNER LONDON  
EDUCATION AUTHORITYDirector—  
Research and  
Statistics Group

Salary Range: £9,119.80-£9,692.80  
(Inclusive of all allowances) (under review)

Applications are invited for the post of Director to be responsible for the Research and Statistics Group set up in 1984. The post has become vacant following the appointment of Dr. Martin Shipman the present holder to a Chair in the University of Warwick.

The Director plays a central part in the provision of information for the Authority and the group provides a comprehensive central statistical service for all branches of the education service. It is also the channel through which the service is kept aware of relevant developments in research. The Director is responsible for advising and directing the Authority's research activities and for educational establishments.

Appropriate qualifications and experience in social science research techniques, preferably in education, are essential.

Application forms and further details from the Education Officer, (EO) (Estab. 2411), Room 367, The County Hall, London SE1 7PB. Please telephone 01-476 2411 for details. Forms to be returned by 14 September 1978.

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Head, Educational  
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Within the salary range: \$20,965-\$23,737 (Ausl Dollars)

This is identical to the Senior Lecturer Scale in Australian Colleges of Advanced Education and Universities. The appointee will be responsible for the work of the unit, the primary function of which will be to ensure the optimisation of the educational experience of all students undertaking the Diploma, Degree and Post Graduate programmes of the Institute by both internal and external study. It is envisaged that a number of other services will also be provided by the unit.

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UNIVERSITY  
OF RHODESIA

## CHAIR OF PHYSICS

Applications are invited for the post of Professor and Head of the Department of Physics, Rhodesia, to be vacant on 31 October 1978.

Applicants should have held a senior university appointment in Physics and have displayed marked ability in both teaching and research. They should preferably have an interest in physics as well as classical physics, and much of the advanced teaching and research in the department will be in the latter field.

Salary Scale: £10,474 to £13,444 (Approp. Bn. equiv.)

Appointments will be on permanent, pensionable terms and include a housing allowance and a pension. The successful candidate will be required to spend a period of at least three years in Rhodesia.

Applications (in triplicate) should be sent to the Director of Education, Rhodesia, P.O. Box 107, Mount Pleasant, Salisbury, Rhodesia. The Director of Education, Rhodesia, will be pleased to receive applications from Rhodesians and non-Rhodesians.

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General Vacancies  
continuedLONDON, E.C.4  
NATIONAL PRODUCTION  
STATISTICIAN

The National Production Statistician is responsible for the collection, collation and analysis of data on the production of goods and services in the United Kingdom. He is also responsible for the publication of the data in the form of statistical tables and reports.

Applicants should have a degree in statistics or a related subject and have at least five years' experience in the collection and analysis of statistical data. They should also have a good knowledge of the statistical methods used in the production of goods and services in the United Kingdom.

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## New Zealand

Political gag on African  
scholarship students

from Lindsay Wright

## WELLINGTON

Amid blunt allegations from New Zealand's sharp-tongued Prime Minister, Robert Muldoon, that the country's leading anti-apartheid spokesman, Mr Trevor Richards, is a traitor to his country, the government has marked International Anti-apartheid Year with an unprecedented clamp on any political activity by recipients of the Southern African Scholarship administered by the New Zealand University Students' Association.

Bringing the fact powerfully home, Mr Richards, a white South African, is a vocal opponent of apartheid. He has been a member of the Southern African Students' Organisation, which completed his low degree at the end of last year.

The Scholarship Trust Board had hoped to bring a woman student from South Africa, Rhodesia or Namibia at the end of this year.

Meanwhile, some 4,000 other private overseas students studying in New Zealand, face no prohibition from the New Zealand government on their political activities in spite of the fact that several Malaysian students were jailed on their return home, apparently for exactly such activities in New Zealand.

NZUSA president and scholarship board chairman Lisa Sackstein claims that the gag is racist in nature. It is not applied, she pointed out, to white secondary school students from southern Africa under Rotary scholarships, who are able to go around giving speeches which are bound to be pro-apartheid.

With their record of support for students on similar issues in the past, the university councils are expected to rally behind the students.



Robert Muldoon: sharp tongue

A fellow scholarship board member, former Victoria University deputy vice-chancellor Professor Ian Campbell, said it was one thing to say the student should not jeopardize his study with speeches, but quite another thing to say the student was not to make a public speech on any occasion.

One of the criteria of the scholarship trust deed is, in fact, that recipients be willing to speak in New Zealand to groups interested in southern Africa, and the deed specifically adds that this criterion is subservient to the primary aim of the scholarship, which is to support the recipient's course of study.

The trust board has reluctantly agreed to accept the gag in order to bring a scholar here next year, but NZUSA will be attempting to nullify the support of university councils in a campaign to persuade the Government to reconsider its stand.

With their record of support for students on similar issues in the past, the university councils are expected to rally behind the students.

Professors face  
heaviest  
workload

from our correspondent

## JERUSALEM

Professors at the Hebrew University of Jerusalem have the heaviest average working week, 51.1 hours, compared with associate professors 48.8, senior lecturers 48.4 and lecturers 44.5 hours. The highest average weekly workload is in agriculture, 51.2 hours, and the lowest in law, 35.2 hours.

These are some of the findings based on questionnaires sent to 883 academics, lecturers, and above, in the university of whom 748 (85 per cent) filled them in, relating to the academic year 1975-76.

The basis was a working year of 47 weeks. Lecturers devote 29.6 per cent of their time to teaching and 52.9 per cent to research, compared with senior lecturers 24.9 and 49.9; associate professors 19.8 and 43.9; professors 17.5 and 41.3 per cent respectively.

Associate professors head the list in time devoted to individual supervision of graduates with 19 per cent compared with professors 17.5; senior lecturers 11.9; lecturers 7.2 per cent. They also devote more of their time to academic work outside the university (paid or unpaid) compared with professors 6.1; senior lecturers 4.9; lecturers 5.1 per cent.

Professors devote 17.6 per cent of their time to administrative work in the university compared with associate professors 11.8; senior lecturers 8.5; lecturers 5.3.

The average time, percentage-wise, devoted by all the academics together to each of the five activities was as follows: teaching 23.9; individual supervision of graduates 12.9; research 47.7; administration 10; academic work outside the university 5.6 per cent.

This was the first serious attempt in Israel to obtain reliable information on the workload of academics. It shows, however, that in Israel, as elsewhere, about half of the academics' time is devoted to research.

It is doubtful whether the survey will silence the polemicists and others who charge that academics receive poorly paid salaries for four to eight lectures a week.

Archbishop calls for end to  
exploitation of foreigners

from Ulf Schmetzer

## ROME

Abdul from Tunisia greets a tourist with a grin: "nice blanket, only 4,000 lire", he says.

Abdul, a second-year medical student, explains: "The tourist season is good now. We have to make money in the summer for the rest of the year."

Further down on the crowded Spanish Steps of Rome his friend Ahmed sits on a stool drawing caricatures of the tourists for 3,000 lire each, and near him, Laura, a blonde from Argentina, sells leather belts.

All three are students supplementing their limited funds with home-made products to pay the exorbitant prices of their humble lodgings. Around them are dozens of Italian vendors—many of them students.

The spectacle is not novel in Italy but this month it made headlines when, in a poignant sermon, the Archbishop of Perugia denounced the exploitation of foreign students by unscrupulous landlords.

Although the attack by Monsignor Ferdinando Lombardini was aimed principally at landlords of cheap student housing, it also drew attention to the plight of foreign students in Italy.

A survey by the Rome daily *Il Messaggero* revealed that the so-called "foreign legion"—comprising student lodgers—pay each an average 120,000 lire (£80) a month for a single room, a rental in which are often included light and gas bills, and often such charges as 1,000 lire (70p) for each shower.

The survey described the rooms as shabby, on the periphery of Rome, barely furnished and with no service. Most rooms were small, squalid.

each frequently containing three beds with every student paying 50,000 lire (about £32) a month.

Forced to hunt for cheaper rooms, many lodgers lived in built-up apartments at night like Ostia where they have to leave their accommodation from May to October and their daily travel to and from the campus takes two hours.

In his sermon the archbishop said: "Many foreign students arrive in Perugia expecting to find better conditions than those they left at home. But how does the city react? On the whole it views the immigrants as subjects of speculation."

The case of the foreign students in Italy is particularly grave since the majority of them come from Third World countries and have limited funds at their disposal.

But even for the native student living in lodgings is a luxury with a high price.

In a country which lacks any infrastructure for student accommodation, Italians, for decades, have been forced to either study at their home town university or stay at home, travelling to the campus only to enrol and for examinations.

And the high cost of lodgings (full board is almost unknown) has exacerbated parental efforts to dislodge their sons from the university student population more evenly and created bizarre contrasts of mass universities like Rome with a 200,000 population (six times its capacity) while many rural universities are nowhere near their capacity.

To improve the living conditions of "the foreign legion" Italian universities have "fought" entire pension, paying their owners 6,000 lire (£3.50) a day for every student. In addition there are just over 1,000 beds in Rome's student houses.

But corruption quickly caught up with the innovations. Where it was for the rent subsidies the living conditions of Italian students could be fairly reasonable. Their grants would comfortably allow them the state-subsidized meals at campus canteens (about 20p a meal) and the heavily subsidized textbooks.

## Women students dominate Kuwait's university. Dilip Hiro continues his look at the Middle East

## Behind the veil

other Arab and Islamic countries, and so on."

This means that different standards are applied to the Kuwaiti applicants and the non-Kuwaiti ones. For example, the engineering faculty was started two years ago. It was decided to admit all the Kuwaiti applicants with 70 per cent grades or more, and then allocate the remaining places to others, on the strict basis of their academic performance. Last year the requirement for the Kuwaitis was reduced further to 65 per cent of the grades.

The result is that, of the 210 places in the engineering faculty, 70 per cent are taken up by Kuwaitis, and 15 per cent by Gulf Arabs. There is a similar policy in the medical faculty.

There are almost twice as many women as men because many Kuwaiti men get sent abroad, for university education, by parents rich enough to afford it but not liberal enough to let their daughters leave home.

Not surprisingly, women dominate the arts and education faculty, and are almost on numerical parity with men in the faculties of pure sciences, commerce, economics and political science, law and sharia.

Women are found in the engineering faculty, especially in its civil engineering and architecture department and in fact a third of all engineering students are women.

The medium of instruction in engineering and medicine, as well as pure sciences, is English. All entrants have to take an English test. Those failing cannot pursue any accredited courses until and unless they pass a special one in English. After that the student must take and pass a course in English every year.

Two years ago, a special language centre was set up to coordinate the teaching of foreign languages, primarily English. Its task is to develop curriculum to suit the specific needs of each of the faculties. With a teaching staff of over 100, it is now the biggest and best equipped centre of its kind in the Middle East.

It is this spirit of innovation that moved the university authorities to substitute the American system of course units for the Continental system of annual examination.

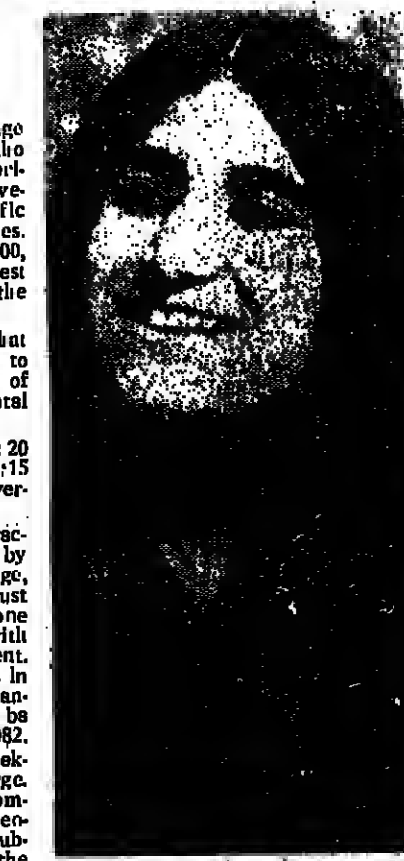
The teacher-student ratio of 1:20 compares favourably with the 1:15 ratio at the oldest American University in Cairo.

However, for the American practice of mixing courses imparted by different faculties in one package, to be effective, a university must accommodate all its faculties on one campus. This is not the case with the Kuwait University at present.

But gigantic construction work is in progress; and, if things go as planned, all the faculties should be housed on a single campus by 1982.

Meanwhile the university is making an impact on society at large. Last year it inaugurated a community service programme by opening centres in the city and its suburbs (containing most of the regional population of one million) where the staff teach non-credit courses in child psychology, arts, home economics, and foreign languages in the evenings.

Unlike many Middle Eastern universities, the Kuwait University has a department of political science in its faculty of commerce, economics and political science, which has the current strength of about 1,200. Of the 200 students majoring in political economy and public ad-



Ooo of the majority of girl students who've shed the veil

ministration, about a half are Kuwaiti, and another quarter are from the Arab Gulf and the rest from Yemen.

Each of the major foreign student groups has a voice in the management of the university. The National Union of Kuwait Students, among the foreign students, the Bahraini and Palestinian students are the most

politically active. Sometimes differences lead to violence. Last February, for example, the members of the Bahraini Students Union, and those of the Bahraini Students Club clashed and four were injured.

The social and political divisions among the Kuwaiti students are not that sharp: they divide themselves broadly as "liberals" and "conservatives", religious.

The last elections to the Students' Union were hotly contested, with the liberals, until then holding 14 out of 15 seats on the student council, facing a challenge from the religious group.

Whereas the religious "brotherhood of Islam" wanted segregation of sexes, and the wearing of long dresses by all women the liberals wanted the university to go completely co-educational and disband the University Councils for Women.

The religious group improved its position on the students' council from one seat to six.

The liberals identify themselves with the Palestinians and other progressive Arab forces; and the religious group with Saudi Arabia, the most powerful neighbour of Kuwait. At the same time, both the students and the university authorities are aware of the rising Kuwaiti nationalism—probably a delayed reaction to the realization that 53 per cent of Kuwait's population and 70 per cent of its workforce are foreign.

Local nationalism expresses itself in terms of pressure from Kuwaiti parents on the university management to admit their children even when their academic performance falls below standard. Although in sympathy with the general idea of giving preference to the Kuwaiti nationals, the management has so far refused to yield.

Parental pressure is bound to increase as the Kuwaiti high schools degenerate over-increasing numbers the university which is expected to expand only modestly until the early 1980s, and then stop growing.

Continued on page 17



# Conflict over practical training

Third World politicians are liable to turn away from the university to other tertiary sector institutions such as technical and vocational colleges to achieve their plans of economic development.

This warning was given at the conference by Commonwealth academic leaders from the Caribbean and Asia, but a number of interventions by Australian and British participants complaining of competition between universities and polytechnics showed the issue had striking parallels in the developed world, where it was compounded by fears of manpower planning by governments.

A clear statement of the issue as seen in the developing world of the Caribbean came from Mr. A. Z. Preston, vice-chancellor of the University of the West Indies. He said: "The notion that the university is the sole repository of higher wisdom and knowledge is ideological anathema to many political leaders who are more interested in the production of manpower to meet needed levels for the management and development of the economy."

They saw "practical training" as a goal and the tertiary colleges as the best place for it.

Mr. Preston concluded the best relation between universities and colleges—Trinidad and other islands between the University of the West Indies and local colleges—was one of "creative tension". Other participants were more brutal.

For example, Mr. Richard Griffiths, director of the Inter-University Council for Higher Education Overseas, who has extensive experience of education in the Commonwealth including membership of the Hong Kong University Grants Committee, spoke of the need to "clobber" the pretensions of the polytechnics and the tertiary colleges.

The tendency of polytechnics—especially in Hong Kong—to take on the kinds of academic work that belonged in the university ought to be stopped.

This triggered in a lengthy debate on whether the distinctions between polytechnics and vocational colleges on the one hand and universities on the other ought to be maintained.

From the Canadian perspective, Dr. Laurent Isbelle, president of the Algonquin College in Ontario, asserted the universities had usurped some of the proper functions of the community colleges.

What to do about the place of existing programmes in the universities, said Dr. Isbelle.

For example, the place of programmes such as library science, business administration, physiotherapy, physical education, teacher training, journalism and many others, must be questioned.

Do they not belong in the community colleges, institutions capable of handling such challenges, and so enable the universities to



Sir Frederick Dainton: scathing attack

utilize their financial and physical resources in areas desperate for the funds so necessary to support research?

From the British side, this debate produced pessimism—Harry Platt, the vice-chancellor of Reading University, observed that political power went with the numbers and the numbers did not go with academic excellence.

But it also produced qualified optimism. Sir Charles Carter, for example, the vice-chancellor of Lancaster University, provided the scheme of cooperation between Lancaster and colleges of education in Lancashire and Cumbria and argued for similar schemes of regional coordination elsewhere.

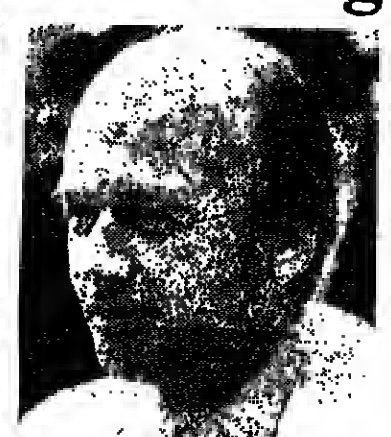
However, there were obstacles. He noted: "I suggested some time ago that my university council and its governing body of the nearest polytechnic should have an overlapping membership. So that at least a few people would know the plans and resources of both institutions. The suggestion was greeted with a stonewall silence."

Sir Frederick Dainton, the retiring chairman of the University Grants Committee, described the occasion of the debate to deliver a scathing attack on the whole of itself was "totally unconvincing". Its author, the civil servant Sir Toby Weaver, had shown great "opacity of thought".

Instead there would have been no problem if the colleges that had been allowed to call themselves universities, Sir Frederick said. What to do in the name of an institution and what to do in the name of a university have always been a mixed bag reflecting different levels of academic attainment.

What was needed now, he suggested, was some coordinating body between the university and polytechnic sector to "minimize the spectrum" of higher education institutions.

Overlooking the debate about the relations of universities and tertiary sector colleges was, the



Sir Walter Perry: spirited discussion

growing conviction of academic—least from developed Commonwealth countries—that modern graduates were very often under-employed when they took jobs.

This was true in Australia. Professor Peter Knapp, chairman of the Australian Tertiary Education Commission, reported that the total number of doctors in his country was 20,000 yet the medical schools were producing 1,400 newly qualified applicants to the medical profession each year.

From Canada, Mr. W. G. Pitman, president of the Ryerson Polytechnical Institute in Ontario, described the passage of his country into a "conservative society" with reduced rates of economic growth and job creation. No longer would the high degree of "subjective choice" be afforded by students.

Instead, Mr. Pitman favoured re-modelling the educational system and joined in a spirited discussion with Sir Walter Perry, vice-chancellor of the Open University in Britain about the impact any new system should have.

Both emphasized ease of transfer in and out of institutions and the maintenance of educational opportunities for adults, but they differed on how they would achieve the aim of universal education.

Sir Walter was explicit. "Society has a much greater need for people with a general education than for people with a specialized education. In fact, we have failed, at least in Britain, to get this message across to our students or to our colleagues in university teaching."

In his prescription for the future, Sir Walter advocated scrapping secondary education in the schools at the age of 16 years, handing the search for institutions other than universities, broader secondary school courses, and expansion of the route into higher education through further education colleges.

He warned the developing countries of the Commonwealth not to allow themselves to be dominated by British preoccupation with specialization at levels as a qualification for university entrance.

# Problems of keeping the balance of power

A finely calibrated balance of power between central and local government in federal systems can protect the autonomy of the universities—but if either party becomes too powerful federal systems can lead to a dangerous erosion of that autonomy.

This general principle was agreed by nearly all the Vancouver delegates. However, they disagreed sharply about the answer to the more practical question of whether universities suffered more from an excess of control or of local power.

This very different experience of the Commonwealth's two must developed countries with federal systems was at the root of this failure to agree.

In Canada, under the influence perhaps of the United States, the provinces have become increasingly powerful in higher education, states there to the detriment of the universities. In Australia, by contrast, the Commonwealth government has become the dominant partner and caused just as much disquiet in that nation's universities.

So it seemed to be a case of the grass is greener on the other side of the fence. Or Ian Macdonald, president of York University, Ontario, complained that in the past ten years a subtle but important shift had taken place in the balance of power between the provinces and the federal government.

Although long an exponent of decentralization, he felt a sense of great unease when this was applied to universities. He added: "Universities have become, at least in administrative outlook, much more provincial in their orientation and in their less national and international. Provincialism has never been a prescription for greatness."

Dr. Macdonald was particularly concerned about two areas: student exchanges between funding agencies which he believed were being undermined by the present practice of specialization and the viability of specialized postgraduate study, which required a national or even an international clientele.

Circumstances in Canada today are such that a major objective in education should be the provision of opportunities for Canadians to learn more about all parts of their country at first hand, he added. "This is particularly true of the university student body for future leadership. To support that objective we should be seeking to ensure a national university community by all possible means."

However, another economist, Professor Sir John Williams, vice-chancellor of the University of Sydney, disagreed sharply. He believed that people in Australian universities would look back with nostalgia to the days before 1974 when funding was shared between the Commonwealth and state governments.

He doubted whether the recent decision to have an official inquiry into study leave would have been taken if effective power had been shared between them.

Professor Williams added that the role of the University of Australia had been reduced because higher education policy was now effectively made by five state ministers.

Another Canadian president, M. K. Oliver of Queen's University in Ontario, took a less gloomy view of the future of Canadian universities under provincial domination than Dr. Macdonald.

He pointed out that in various parts of Canada, the United States and India, federal systems of government permitted a degree of mobility for scholars and students that would not be possible if national barriers intervened.

But even Dr. Oliver was concerned about the danger signals that the fall in the birth-rate was the same in all parts of Canada as in the birth-rate in the United States.

At times it was perhaps a little too redolent of the academic general that remains such a strong characteristic of universities in these countries which not so long ago were painted red on maps. One doubler among the delegates, the registrar of one of the Commonwealth's more ancient universities, called it a family picnic.

Although he quickly explained that such infrequent picnics could not really be frowned upon.

Picnic was not a bad word. Salmon barbecues, concerts, hot air balloons, and the like, were all part of the family picnic. It was not to be used to create a time as in the past of political frivolity. For the small contingent of Americans from south of the border with their tradition of rather shaggy conventions and the rather larger contingent of French Canadians with their more rigorous Cartesian intellectual upbringing it was a bewildering occasion.

Yet at a less superficial level the congress was an occasion of high scholarship. Like previous Commonwealth congresses, this one was a well-organized, well-run, and well-attended affair. It revealed, obliquely but not obscurely, the common concerns of all Commonwealth countries. Ten years ago the theme would have been the strains of economic or student unrest. This year it was the infinitely more complex task of how universities could remain true to their traditional mission yet meet the new and pressing demands made on them by governments and peoples.

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Professor Williams added that the role of the University of Australia had been reduced because higher education policy was now effectively made by five state ministers.

Another Canadian president, M. K. Oliver of Queen's University in Ontario, took a less gloomy view of the future of Canadian universities under provincial domination than Dr. Macdonald.

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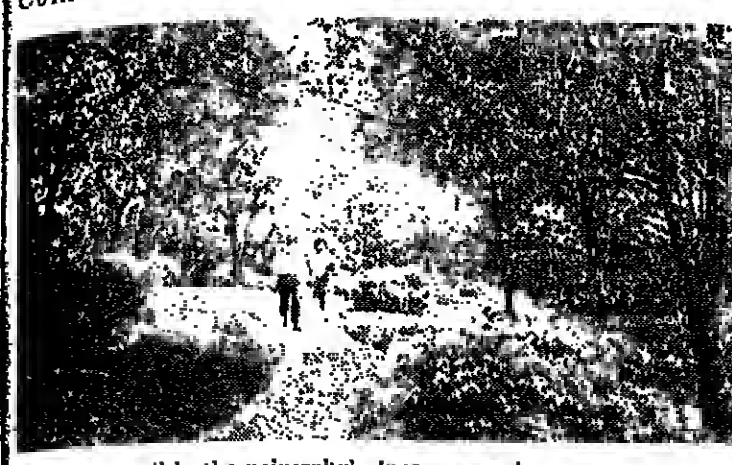
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Professor Williams: nostalgia



A peaceful stroll in the university's Japanese garden

# Vice-chancellors in mufti on a quiet family picnic

The Commonwealth Universities' Congress which was held at the University of British Columbia in Vancouver last week was like its characteristic stretching back to before the First World War, very much a private occasion, a quiet, genteel gathering of the vice-chancellors of the Commonwealth.

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# Food research must cater for local needs

A warning was sounded by nutritionists and agricultural experts attending the conference that the university must go a long way to the research and development needed to solve the world's food problem.

Coordination with government programmes was necessary, said Professor R. S. Musangi of the University of Nairobi, and from Professor D. W. George of the University of Newcastle in New South Wales came the prediction: "University personnel may need to contribute more in governmental and industrial settings than within their own laboratories."

With this emphasis on the need for cooperation between the universities and governments, especially in the less developed countries, came advocacy of local research by universities geared to what Dr. H. Peter Oberlander, a Canadian geographer, called "the direct needs of the society at the door."

On this theme Mr. Sardar B. S. Samundri urged the universities to make large-scale investments in research on food crops—"research meant exclusively for the solution of locally felt needs of society."

Such research work did not absolve universities from their commitment to research in basic sciences. Or Adelewe Olanluwa of the University of Ife in Nigeria said it was their responsibility always to keep sight of "the whole problem."

It is incumbent on us to let the politicians as well as the man in the street know the truth," he said.

In their work on new strains of crops, methods of irrigation, veterinary techniques and animal husbandry, the universities of the less developed countries ought to be able to count on help from the long established universities.

Or Olanluwa urged the transfer of knowledge, technology, expertise and equipment from the one to the other, with the proviso that students to be trained in the universities should be able to work in the fields of the less developed countries themselves.

A detailed programme for co-operation between the universities, the developed countries and those in the developing Commonwealth countries was set out in the first plenary session of the conference by Sir John Crawford, chancellor of the Australian National University.

This included tackling at the request of developing countries research problems beyond the capacity of universities and research centres there; sharing research on a basis of equality; and offering training in the advanced countries in order to accelerate the build-up of research capacity in the less developed countries.

Sir John scorned pessimists who argued the imbalance between food and population was a lost battle saying the universities still had a "positive role" to play.

To a casual observer it all seemed to have very little to do with the grand theme of the congress. The superficial impression created in Vancouver was one of fragmentation—between the five topics and between nations, especially between the rich and the poor of the Commonwealth.

Yet in a subtle way there was an underlying unity. Again and again the delegates showed how they felt universities in the Commonwealth were under pressure from government everywhere but particularly in the Third World and in federal states like Canada itself and Australia; from liberal reform of secondary schools and examinations especially in Britain; from competition and often entrepreneurial values like the polytechnics or the colleges of advanced education.

This pressure may be steady rather than intense but it has created a mood of discreet anxiety and restlessness. The pressures are not uniform. The individual of having to deal himself with the complexities of stage two.

Dr. Perkins estimated that over 700,000 students are currently studying in countries other than their own—200,000 of them from Africa.

The three roles, according to Sir Charles, defied an "arena of endless debate" with participation

# Strong cases made for and against relevance

The various sessions on "relevance"—with titles like "the relevance of the curriculum to the needs of society" and "the relevance of university education and research"—produced an interesting contrast between speakers who worried in general terms of the dangers of linking university activities too obviously relevant to immediate social needs, and those who gave highly specific examples of cases where universities had made a successful effort to be relevant.

The first category included Sir Peter Noble, principal vice-chancellor of Aberdeen University, and Dr. Charles E. Beaulieu, vice-president for academic affairs and research at the University of Quebec. The second included Dr. C. Matthews, president and vice-chancellor of the University of Waterloo, Canada, who gave an excellent account of the ways his and other institutions are providing services to industry, and one of the very few "students" to address the congress, Dr. Alec Olick, founder and honorary director of Britain's Community Service Volunteers.

To Sir Fraser, "what is relevant, both to the individual student and to society is what is learned with a will. It is an illusion to think that you can learn to make the difference between life and to society and can keep relevant in that sense in the future."

The danger of talking about relevance to the needs of society, he said, is that governments, which by their nature tend to make the views, will be obsessed by some "fantasy of human utility", and prescribe a syllabus to be operated in a structure of credits and qualifications.

It is fair to suggest that the curriculum should take some account of the need for manpower with special skills, Sir Fraser conceded, but "the important thing for the university planning the curriculum and the student choosing his course is not to think short."

Rather we must think long, appreciating that careers will change, that even in a given profession there will be new knowledge to acquire later, perhaps in a field undreamed of at the stage of professional qualification.

Sir Fraser said he was worried about the pressures on universities in the developing Commonwealth countries from their governments to introduce specific curricula, "and I am apprehensive about some of the criteria for aid which are now prescribed by the British Overseas Development Administration which increasingly circumscribe the help which we might, in free cooperation with you, extend to your colleagues and students."

Dr. Beaulieu's attitude was very similar. He wanted universities to "give an increasing importance to general education and personal development programmes, programmes centred on independence of thought, an ability to synthesize, and fostering creativity."

Another possibility is the joint involvement of university and industry in large research projects, along the general lines of the new "teaching computers" in Britain.

The "consortium arrangement" is a third approach. Dr. Matthews described the University of Waterloo's consortium with two local companies to carry out a research and development contract for the Canadian government in the solar-energy field.

The university has hired a team of full-time researchers (recent master's and doctoral graduates) to work under the supervision of academics active in solar energy research. The initial stages are taking place mainly in the university, but the industrial involvement will increase as work proceeds and some of the young researchers may move with the project into the companies concerned.

Dr. Matthews pointed out that much technology arising out of university research is in such a "raw state" that no industrial company will accept it.

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Sir Charles picked out two topics which are currently being debated very actively in the arena: "relevance" and "access" (both featured prominently in the subsequent programme of the congress).

He coined the memorable phrase—the "new relevants"—and challenged the relevants to answer some "stiff questions". For example, who tells us what national needs are? Are these short term or long term needs? And these needs: economic, social, political, welfare policies, manpower plans—how reliable are they? Will students still be free to choose what they will study? He left the replies to others.

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# Worldwide worry over new restrictions on academic mobility

Academic mobility is central to the interests and purpose of the Association of Commonwealth Universities, and it normally crops up as a topic of discussion at the quinquennial congresses.

This year's session on "mobility of students" and "staff" drew national attention, not least in the delegates' enthusiasm for scholarly experience overseas, but concern about new restrictions on academic mobility.

However, statistics presented by two speakers, Dr. Frank Thistlethwaite, vice-chancellor of the University of East Anglia, and Dr. James Perkins, president of the International Development Council for Educational Development, demonstrated that movement of students and academics between countries is still growing, despite the obstacles.

Sir David Barham, vice-chancellor and principal of the University of Melbourne, started the session by reporting the reasons why international academic mobility is necessary for the health and strength of universities. These well-known truths need repeating today, he said.

The first essential for its achievement is, of course, for universities to be free to seek appointments to their available academic posts from the best available in the world and for them not to be restricted by employment policies, otherwise responsible for their local community," Sir David said.

Satisfaction of that requirement, however, may not be enough. Other devices and procedures must be used to ensure that the work proper to a university can be in touch with the best work anywhere in the world. Interchange schemes, study leave schemes and the like, so of communication and enrichment are required.

Where restrictions on mobility are irresistible, Sir David said, universities should observe an order of priorities: "First, for creative and productive academic leaders by way of travel and visits; second, for postgraduate students and research trainees; and third, for undergraduate students."

Thistlethwaite presented his colleagues with an up-to-date version of some figures on student and staff mobility that Sir Robert Atkinson, University, had offered the 1968 Commonwealth Universities' Congress.

In the five Commonwealth countries selected for the student mobility statistics—Australia, Canada, India, New Zealand and Britain—the number of overseas students rose by between 96 per cent (Australia) and 343 per cent (Canada) over the period 1961-62 to 1974-75.

Since these countries also experienced a rapid growth in the number of home students, the proportion of overseas students did not increase in all of them, though in Canada it went up from 5.5 to 9.5 per cent.

In India, Canada and New Zealand the proportion of Commonwealth students in the total overseas enrolment increased somewhat between 1961-62 and 1974-75.

But in Britain it dropped substantially, from 60 to 38 per cent. The most noticeable fall was in the number of Indian students in British universities—1,660 in 1961-62 and 987 in 1974-75.

The number from the West Indies fell, too, from 387 to 189. On the other hand, the number of students coming to Britain from Malaysia and Singapore rose even more dramatically, from 434 in 1961-62 to 2,860 in 1974-75.

Dr. Thistlethwaite's figures also showed a big increase in the recruitment of staff who started their academic life in another country. The number of academics in well-known universities in Canada, Australia and New Zealand who had obtained their first degrees in another Commonwealth country, rose remarkably, both in percentage and absolute terms, between 1962 and 1976.

At McMaster University 537 of 1976 were not graduates of Canadian universities. Britain provided 20 per cent of the staff and the United States most of the rest.

At the universities of Sydney and Melbourne 35 per cent of academics have first degrees from abroad, and the proportion from the other Commonwealth countries (India) rose from 16 to 23 per cent over the period 1962-76.

Indian universities have fewer academics with first degrees from abroad, for example 10 per cent at Allahabad and 22 per cent at Bombay. On the other hand, Indian qualifications have become much more acceptable overseas, the number of academics at nine well-known universities in Britain, Canada, New Zealand and Australia rose from seven in 1962 to 89 in 1976.

Dr. Perkins, former president of the Association of Commonwealth Universities, said that the mobility of students and staff was essential for the health and strength of universities. These well-known truths need repeating today, he said.

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**Coleraine opened only one year before Ulster's Troubles flared. A Commons committee has discovered the consequences**

Figure 1. The effect of the concentration of the solution on the adsorption of the dye. The concentration of the solution was 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 15.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0, 100.0, 150.0, 200.0, 300.0, 400.0, 500.0, 600.0, 700.0, 800.0, 900.0, 1000.0, 1500.0, 2000.0, 3000.0, 4000.0, 5000.0, 6000.0, 7000.0, 8000.0, 9000.0, 10000.0, 15000.0, 20000.0, 30000.0, 40000.0, 50000.0, 60000.0, 70000.0, 80000.0, 90000.0, 100000.0, 150000.0, 200000.0, 300000.0, 400000.0, 500000.0, 600000.0, 700000.0, 800000.0, 900000.0, 1000000.0, 1500000.0, 2000000.0, 3000000.0, 4000000.0, 5000000.0, 6000000.0, 7000000.0, 8000000.0, 9000000.0, 10000000.0, 15000000.0, 20000000.0, 30000000.0, 40000000.0, 50000000.0, 60000000.0, 70000000.0, 80000000.0, 90000000.0, 100000000.0, 150000000.0, 200000000.0, 300000000.0, 400000000.0, 500000000.0, 600000000.0, 700000000.0, 800000000.0, 900000000.0, 1000000000.0, 1500000000.0, 2000000000.0, 3000000000.0, 4000000000.0, 5000000000.0, 6000000000.0, 7000000000.0, 8000000000.0, 9000000000.0, 10000000000.0, 15000000000.0, 20000000000.0, 30000000000.0, 40000000000.0, 50000000000.0, 60000000000.0, 70000000000.0, 80000000000.0, 90000000000.0, 100000000000.0, 150000000000.0, 200000000000.0, 300000000000.0, 400000000000.0, 500000000000.0, 600000000000.0, 700000000000.0, 800000000000.0, 900000000000.0, 1000000000000.0, 1500000000000.0, 2000000000000.0, 3000000000000.0, 4000000000000.0, 5000000000000.0, 6000000000000.0, 7000000000000.0, 8000000000000.0, 9000000000000.0, 10000000000000.0, 15000000000000.0, 20000000000000.0, 30000000000000.0, 40000000000000.0, 50000000000000.0, 60000000000000.0, 70000000000000.0, 80000000000000.0, 90000000000000.0, 100000000000000.0, 150000000000000.0, 200000000000000.0, 300000000000000.0, 400000000000000.0, 500000000000000.0, 600000000000000.0, 700000000000000.0, 800000000000000.0, 900000000000000.0, 1000000000000000.0, 1500000000000000.0, 2000000000000000.0, 3000000000000000.0, 4000000000000000.0, 5000000000000000.0, 6000000000000000.0, 7000000000000000.0, 8000000000000000.0, 9000000000000000.0, 10000000000000000.0, 15000000000000000.0, 20000000000000000.0, 30000000000000000.0, 40000000000000000.0, 50000000000000000.0, 60000000000000000.0, 70000000000000000.0, 80000000000000000.0, 90000000000000000.0, 100000000000000000.0, 150000000000000000.0, 200000000000000000.0, 300000000000000000.0, 400000000000000000.0, 500000000000000000.0, 600000000000000000.0, 700000000000000000.0, 800000000000000000.0, 900000000000000000.0, 1000000000000000000.0, 1500000000000000000.0, 2000000000000000000.0, 3000000000000000000.0, 4000000000000000000.0, 5000000000000000000.0, 6000000000000000000.0, 7000000000000000000.0, 8000000000000000000.0, 9000000000000000000.0, 10000000000000000000.0, 15000000000000000000.0, 20000000000000000000.0, 30000000000000000000.0, 40000000000000000000.0, 50000000000000000000.0, 60000000000000000000.0, 70000000000000000000.0, 80000000000000000000.0, 90000000000000000000.0, 100000000000000000000.0, 150000000000000000000.0, 200000000000000000000.0, 300000000000000000000.0, 400000000000000000000.0, 500000000000000000000.0, 600000000000000000000.0, 700000000000000000000.0, 800000000000000000000.0, 900000000000000000000.0, 1000000000000000000000.0, 1500000000000000000000.0, 2000000000000000000000.0, 3000000000000000000000.0, 4000000000000000000000.0, 5000000000000000000000.0, 6000000000000000000000.0, 7000000000000000000000.0, 8000000000000000000000.0, 9000000000000000000000.0, 10000000000000000000000.0, 15000000000000000000000.0, 20000000000000000000000.0, 30000000000000000000000.0, 40000000000000000000000.0, 50000000000000000000000.0, 60000000000000000000000.0, 70000000000000000000000.0, 80000000000000000000000.0, 90000000000000000000000.0, 100000000000000000000000.0, 150000000000000000000000.0, 200000000000000000000000.0, 300000000000000000000000.0, 400000000000000000000000.0, 500000000000000000000000.0, 600000000000000000000000.0, 700000000000000000000000.0, 800000000000000000000000.0, 900000000000000000000000.0, 10000000

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The project is funded by the association that photographers and psychologists have much to teach

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August 28, 1978, was the 150th anniversary of the birth of Count Lev Nikolayevich Tolstoy, who is still regarded by the vast majority of readers and critics as Russia's greatest novelist, and whose influence throughout the world as a

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his aristocratic upbringing, his first-hand acquaintance with war, his deep interest in his country's history, his microscopic observation of his close family and friends, his keen sense of the social conditions, the echoes and resonances of the past, the art which conceals art, which a closer analysis of the text continuously to reveal.

knowledge of our own history and the history of the world, and a breadth of sympathy and understanding and an anger tempered by charity. His extraordinary powers of observation and his encyclopaedic profession d'été, covering all the major social problems of the day, would enable him to write a novel as finely spun as the finest of them. This does not mean that he is not a powerful writer, but it does mean that he is not a powerful writer in the same way as the great novelists of the past.

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Two views of campus life abroad, with cartoon interpretations by Kipper Williams

# Drawbacks of university life—French style

After a week of oral examining in which at least two of every three candidates hesitatingly expressed their admiration for the British way of life, and in particular their wistful hankering after British student life, I began to wonder if we in the United Kingdom really appreciate how lucky we are.

Financial cutbacks and unfilled posts notwithstanding, a year of teaching in a French university makes one realize that British universities have a solid human core which money problems can do little to alter.

On the surface, French universities face similar problems in these areas. Finance is a continual millstone, and when a member of staff leaves it is not certain he will be replaced. The SNESUP, more politically orientated and less gentlemanly than the AUF, laments the lack of promotion prospects which result from the massive expansion of the 1960s. Final year undergraduates in arts subjects, on courses traditionally leading to secondary school teaching, are increasingly having to enter further training in order to find employment in other fields.

But there the similarity ends. The Université de Bretagne Occidentale with its 7,000 students is very small, by French standards, and much less impersonal than other French universities. I have known, but even it totally lacks the community feeling which is part and parcel of any United Kingdom

university. For my colleagues in the arts faculty, the university is no more than the building where they teach for a few hours each week. It is rare indeed to find a lecturer in his office. Generally speaking he arrives in the classroom complete with coat and briefcase, straight from his car to which he returns directly afterwards. Timetables are usually arranged so that lecturers have a normal practice for a lecturer in his group all his classes so that he need only come to the university twice a week. Three of my colleagues in the English department actually live in Paris, over 350 miles away, and spend only a couple of nights a week in Brest.

Such a system clearly makes it well nigh impossible for students to freely discuss their teachers on anything but the most superficial level. It also creates time-tables which are pedagogically undesirable, like the first-year class in one foreign language which has all its weekly hours in that subject crammed into one day in the week.

There is nothing to keep either staff or students at the university between classes, no coffee-bar, common-room, and no SCR facilities. (The essential piece of departmental equipment, the ubiquitous headway in France, has yet to make students alike, the only refreshment available is from the dispensing machines tucked away in cramped, chairless ground-floor

rooms. The problem is aggravated by the university's situation in a brand-new suburb of multi-story flats, with few of the cafés of a traditional French town centre. The student residences, too, are no more than blocks of rooms, with none of the built-in social life that one finds in British. All but 15 per cent of the students belong to Brest or the surrounding department of Finistère, but they adhere as firmly as their elders to the university's concept of "le weekend". From Friday to Monday only the foreign students remain. Even on weekdays the campus is deserted after 6 pm, apart from the large lecture theatre which houses the only student-organized activity, the popular film-clubs which operate three nights a week.

Students lament the lack of community life and speak longingly of the idea of a students' union that they have heard of in higher education establishments in Britain. But the very attitude towards university life is so different that it is hard to imagine the possibility.

As university entrance in most subjects is automatic for anyone who has his baccalauréat, large numbers of students arrive without any clear notion of why they are there. They disappear with alarming regularity. Brest 40 per cent of first-class arts students in 1976-77 drifted away without even sitting their first exams. One thing the foreign teacher has to learn is that in over-growing number of university places in the classroom does not necessarily mean that students

are hectoring his particular class. Many of those who persevere into second and third year, and the majority of those continuing beyond the licence, have in fact part-time jobs, usually as secretaries or as unqualified teachers. In order to pay their way. This no doubt partly explains why the university's role declines to that of a provider of a certain number of necessary classes. These students with the energy and maturity to organize spare-time activities tend to find a job in order to be independent of their parents.

Disappointed, however, student involvement in the education of others does not necessarily mean lively undergraduate classes. In my experience the opposite is true: although such students are frequently hardworking and exceptionally well-organized, and except from some isolated country towns, simply leaves them too exhausted to do more than listen politely in the lecture.

In most cases, of course, there is little encouragement to do any class work. Although large lecture reforms of the 1960s in that in arts most teaching is done in groups of 30 students or less, most lecturers still merely deliver a prepared lecture and leave without the slightest effort to engage the students, even if there are only half-dozen present. Rarely do they bother to learn students' names.

The students themselves are conditioned to accept the system. They seem uncertain how to deal with the non-member of staff who is willing to engage in informal discussion or disagreement in class. In an uphill task, even though some students may be quite articulate in private. Even in a secret world much more than man, the student is not free to express his views, without which human life would be sadly impoverished. It is the love of the field and his respect and tolerance which have embraced for him all living things, animals, birds, trees and plants, without which human life would be sadly impoverished. It is the love of the field and his respect and tolerance which have embraced for him all living things, animals, birds, trees and plants, without which human life would be sadly impoverished.

Admittedly, for examination purposes, French undergraduates depend on retaining the products of individual teachers' lectures. The final year of the licence, when it is no longer a matter of rote learning and no external examiner. For me, working for a year in another system has provided a unique opportunity for reflection. What shall I teach in a year? I return to teaching in a year, not with a group of students, but not afraid to speak their minds, exchanging notes with colleagues over a cup of coffee. They are not only active participants in the learning process, but they are also the bearers of the system.

Kathleen McKillop

The author has been teaching English at the Université de Bretagne Occidentale at Brest.

## Look west, young man, and note how well off you are

If the president of the NUS and his cohorts are considering territorial expansion they could do a lot worse than send an advance party to the United States. The plight of American students will bring tears to the eyes of even the most hardened NUS warrior.

Gone are the days of ardent and articulate American student activists. The turbulent days of the March on the Pentagon, of Kent State and of Chicago (when students were at least vocal, albeit for reasons other than their own) have been replaced by a state of morose hopelessness. Spite and defiance has given way to a morose passivity. Lethargy and passivity abound in the national level at a time when the hurdles and penalties are probably more profound than those faced by the comparable one-group in any other country. In a nation reared on the strength of independent lobbying and ostentatiously paying court to their own groups, the silence of students at the national level becomes all the more peculiar.

In most States (the notable exceptions being California and, to a lesser extent, New York) students are presented with a host of ugly realities. Of all the present concerns by far and away the most important is the increasing power of the back in education. Should an American teenager, for example, aspire to dentistry, his total eight-year educational bill will be in the region of \$80,000.

Only the wealthy, the highly gifted or the viciously determined can ever hope to receive the education offered by the private universities with most prestige. For the majority the financial burdens of education will hover the first few years of their working life as a recurring nightmare. And today even the local schemes are encountering opposition. Last year President Carter considered, but ultimately stopped, student loans, and lending institutions are voicing concerns about the 12 per cent default rate.

It is impossible to exaggerate the difference between the problems encountered by British students and their American counterparts. Students have to pay the market price for accommodation, food and books. They are entitled to few protection from the profit-seekers. No longer can it be argued that the parents' "aid effort" to send their

children to the private universities where, in general, the best education and prizes of the past few years American is in danger of being lost for good. The future of the American student is in the hands of the market.

There are other sources for vocational education. Students generally have to enter the workforce at an early age. In many colleges, technical education is provided with closed-circuit television systems to enable students to hear and see their lecturers. All too frequently they are taught by hired students rather than by faculty. It is not unusual for students to be asked to teach courses for which they applied, and many will be denied the opportunity of being taught by the lecturers that attracted them to a particular university.

The confusing factor in American politics is that while on the national level they lack any cohesive unity, students participate fully in the day to day life of their university. Participatory democracy is not limited to the theory of political science; it is actively and vigorously practised. Most colleges possess vigorous undergraduate assemblies where many local issues are aired. At the end of each semester students are asked to evaluate faculty on matters ranging from clarity of lectures to fairness of grading.

Decisions about faculty tenure are almost always made with inflated student participation. Teachers designing new courses will earnestly seek students' opinions on the subject or handouts which determine standards. Within individual colleges and universities American students enjoy an unparalleled participatory status. Despite this, however, the American student is not a real say in the education. They seem to be deflected by flickering trivialities from the major dilemmas of the day.

Three organizations purport to represent American students. The oldest is the National Student Association whose credibility suffered severe damage when it was revealed that its coffers had been generously filled by the CIA. Another body with an equally impressive record is the National Student Lobby. This latter group was

founded after Interstate war within the National Student Association. The two bodies, due to impending bankruptcy, merged in the middle of the year.

Both organizations claim to represent all American students, yet their effective constituencies remain at the large state universities. The rest of their membership consists of occasional members at other institutions. Most campuses do not possess official bodies, but the bodies in place are fully staffed offices.

The third organization, COPUS (The Coalition of Independent College and University Students), is essentially a reorganised level of middle-class students attending private universities. It was established three years ago and now has offices in Washington and a six-figure annual budget. Consciously styled on the lobbying activities of major corporations it seeks change through powers of persuasion and other approach. With the support of several university presidents and with the encouragement of men like Kingman Brewster, COPUS hopes to enlarge federal aid to students.

Despite the existence of these bodies most students remain unaware of their presence. All three are unable to command political recognition, media attention or public acknowledgement.

The reasons for this are obvious. The national scene is difficult to fathom. No doubt geographical circumstances are an important deterrent to consolidation and centralisation. To add to the students who seek entrance to graduate professional education, the majority of undergraduates have an option to submit their thesis to the demands of continual assessment. Many other equally defunct bodies exist. The reasons for this are obvious. The national scene is difficult to fathom. No doubt geographical circumstances are an important deterrent to consolidation and centralisation. To add to the students who seek entrance to graduate professional education, the majority of undergraduates have an option to submit their thesis to the demands of continual assessment. Many other equally defunct bodies exist. The reasons for this are obvious.

Michael Moritz

The author has been studying in a private eastern university in America.

## The tragic enigma of Tolstoy

Continued from page 9

Manual labour in the fields or in the garden, is just as much a part of a balanced and interesting personality.

For me, working for a year in another system has provided a unique opportunity for reflection. What shall I teach in a year? I return to teaching in a year, not with a group of students, but not afraid to speak their minds, exchanging notes with colleagues over a cup of coffee. They are not only active participants in the learning process, but they are also the bearers of the system.

Kathleen McKillop

The author has been teaching English at the Université de Bretagne Occidentale at Brest.

L. Jonathan Cohen replies to the critics (THES, August 4) of his article about Popper and Bacon (THES, July 14)

## What scientists cannot learn from Popper

The popularity of Sir Karl Popper's ideas is clearly demonstrated by the number with which their numerous adherents defend them. But popularity does not establish validity, and the technological value of Popper's science has not been vindicated.

The crux of the matter is still the same. According to strict Popperian principles inductive reasoning has no place in science: there is no rational way to assess the extent of positive support that experimental evidence provides to a hypothesis. But against this it has to be insisted that science affords no rational basis for technology unless scientists can supply evidential support for their hypotheses. Engineers apply laws that are appropriately vouched for by the text-books. So Popperian science cannot supply the intellectual foundation that technology requires.

Popperians of course accuse their opponents of misunderstanding and confusion. But the dilemma is really a simple one that there is really no room for any misapprehension. Either Popperian science is consistently anti-inductivist, thereby cutting itself off from technological reasoning. Or it adopts a criterion of evidential support, thereby sacrificing its anti-inductivist stance.

The original (1934) German edition of Popper's *Logik der Forschung* is impaled on the first horn of this dilemma. It is a classical statement of a purely theoretical ideal. Among competing hypotheses, which have all survived whatever tests can be made of them at the time, scientists are said to choose always the boldest, i.e. that hypothesis which has the greatest prior improbability. But neither this nor anything else is allowed to be my kind of reason for believing that such a hypothesis is true or even that it has at least some degree of reliability.

Some of Popper's supporters, like David Miller, still seem to be content with this ascetic doctrine. Their advice to technologists is just to avoid propensities and theories which have not withstood the severest tests available. "But science is for its own sake, is it not?" they ask. "It is not for the sake of the world, but for the sake of the mind." This is a noble sentiment, but it is not a criterion of choice between unfalsified theories.

So other Popperians (like Ferguson) claim instead that a theory can help us to predict future events only in those areas in which it has already "proved its mettle" and at this point, they say, we can begin to "prove their mettle" for particular purposes, the surrender to Baconianism is obviously complete. Though Popper's motto has been kept on the banner, the

most of Popper's supporters, however, profess to involve themselves in the other horn of the dilemma. Sensing the untenability of a criterion of science that is utterly cut off from providing a rational basis for technology, they seek to construct a criterion of "reliability" (like R. S. Holmes) or of "evidential support" (like Colin Ferguson) out of what Popper has said about pure science. They choose between hypothesis and another. And while this is scarcely consistent with Popper's original anti-inductivist doctrine, it does echo some later remarks of his that are published in one of the appendices to the English translation (1959).

But what exactly is the substance of their criterion? Popper's own (1959) version implies a relatively high level of reliability for the science, say, or medicine which is made or used in accordance with the boldest conjectures that have survived the tests. But this would endorse a quite unacceptable rashness to engineers and physicists.

Scientists are very often free, at any particular date, to make conjectures about the outcome of conditions—conjunctions of variables, for example—whose validity is far beyond the limits of our capacity, at that date, to test in a laboratory. Technologists are nevertheless wise to keep the range of the theories that they actually use, or rely on, fairly close to the variety of relevant conditions that have already been observed in experimental tests. No doubt boldness increases testability. But superior testability is worthless as a basis for actual use unless accompanied by correspondingly superior test-retests.

Not surprisingly, therefore, some of Popper's supporters (like Haines) profess a more defensible, if less gauging reliability they regard the relative boldness of a hypothesis as "irrelevant" and hold that only "demonstrated resistance to falsification" is significant. But this is just a crude inductionist which provides no criterion of choice between unfalsified theories.

So other Popperians (like Ferguson) claim instead that a theory can help us to predict future events only in those areas in which it has already "proved its mettle" and at this point, they say, we can begin to "prove their mettle" for particular purposes, the surrender to Baconianism is obviously complete. Though Popper's motto has been kept on the banner, the

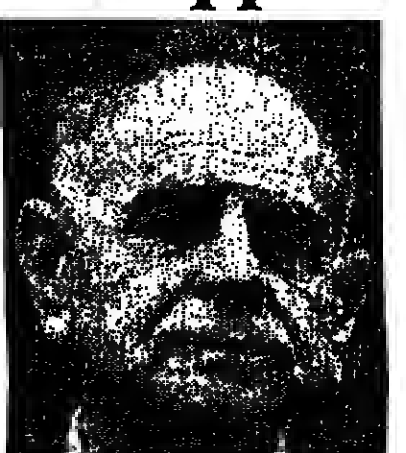
guiding programme is now Bacon's. In short, Popperians can give no satisfactory account of technology as a rational activity. But why has Popper's philosophy seemed so plausible to so many? One good reason is that, once its untenable anti-inductivism is disregarded, much of the rest is a brilliant restatement of certain fundamental truths about the nature of science. The importance of falsification and falsifiability, the need for more and more comprehensive explanations, the value of theories that turn out to lead us to new knowledge—all these points were long ago stressed by Bacon, Whewell and others. But they needed to be reformulated in contemporary terms.

Why, then, it may be asked, should Popper and his supporters have also taken up on anti-inductivist stance, which cuts them off from giving a coherent analysis of the relation between science and technology? The root of the trouble emerges at the very beginning of Popper's *Logik der Forschung*, and often reappears in the ideas of Popper's supporters (like David Miller and Roger Jones). It is an over-reaction to Hume's sceptical arguments about our knowledge of causality.

Hume showed quite successfully that, when properly understood, causes do not logically imply their effects, the future is not logically deducible from the past, and ordinary scientific generalizations can never claim logical truth. Something must always happen to surprise us, therefore, every natural theory is in principle always open to correction or replacement in the light of future experience.

It does not follow, however, that at any particular date we have no rational criteria for grading theories in terms of their experimental evidence then available. What do we actually do, when we control the conditions under which a hypothesis is tested, or investigate the explanatory power of a proposed theory?

We use the knowledge that we have of the world, and we know that relevant factors to control, or relevant uniformities to be explained—in order to gauge how strong a claim to knowledge can be made in the light of observable evidence, on behalf of the hypothesis or theory. Of course, our existing criteria may need modification; we may have overlooked a hidden variable, perhaps, in some of our experiments. But the fact that these criteria of inductive reasoning



Sir Karl Popper

are themselves empirically corrigible, does not debar them from rational employment.

Moreover, what both Hume and Popper failed to notice is that, when hypotheses are graded in this Baconian style, the gradings share a common structure with attributions of logical truth. Logical truth is not, as Hume thought, in a quite systematic way, to be just a limiting case of inductive reliability. I have worked out the details of this elsewhere—in *The Implications of Induction* (1970) and *The Probable and the Provable* (1977). But the point is not open to serious challenge.

It follows that Hume's arguments need no longer frighten philosophers into thinking that inductive reasoning is necessarily irrational. Consensus is a moral issue. No one supposes now that birds are not numbers. They count as numbers because they share the right properties with the paradigms of numberhood—the integers. Analogously inductive gradings should count as rational, at least in so far as they share a common structure with assertions of deductibility.

So there is really no adequate basis for Popperian anti-inductivism, and no philosophical reason for my on to reject the commonsense view that in trusting our lives to the products of modern technology we are implicitly trusting them to systems of inductive reasoning. The pursuit of scientific truth and of intellectual power may nurture should be on one mind the same objective, as Bacon claimed.

The author is professor in philosophy at Queen's College, Oxford.

## Model E students will radically change the system

Peter Brinsford assesses the likely impact of the most favoured of the options outlined in the Higher Education into the 1990s discussion paper

Mass higher education is on its way. The alarms are sounding in the citadels of excellence. Defensive postures have been adopted. Rolf Darendorf (*THES*, June 2) appeals for separate research institutes; Martin Trow (*Minority*, autumn 1977) for separate undergraduate institutions for the academic classes and masses, with polytechnics on the British model well suited to the latter.

Personally, I like to think of him, as somebody who offended academic standards, but as a man who never gave up trying and who was enough to admit his mistakes. Someone who was deeply disenchanted with material values, a non-believer in the status quo, a man who was not afraid to write, as Malraux said, "in what is said then to the strength of the personality which lies beneath".

The impact of the new Model E takes on the scale apparently anticipated and hoped for by participants and universities alike will be considerable. There is a world of difference between entering

higher education in late adolescence as a form of social finishing, or as a necessary preliminary to a career, the motivating forces of the mass entry elsewhere, and entering it as an assertion of a social and economic right, and as an alternative to an under-employment. The group with these latter motivations will have very different expectations of teaching, of learning, of the ultimate purposes of the experience. They will, in short, expect a different style of education.

As a dominant group in future undergraduate intake, Model E students will have far-reaching effects. Personal contact with the relatively small numbers of such students currently in the system makes this clear. They will make different demands, and more demands ranging from the technical to the ideological. Starting with certain technical difficulties they will expect to have them explained, not perfunctorily, but in a manner that will be to them an exposure to oral, will have to be taught, not assumed; so, too, will many techniques for handling assessment situations.

This does not mean an inverting of standards. On the contrary, students are likely to be more critical of bad teaching; more lucid to suspect and look for academic uncertainty among staff; more able to penetrate the camouflage of confident academic conceits. They will, most of all, expect to know the particular objectives of their courses. This is easy enough in technological subjects and other practical courses, but who really expects the Model

E flood to swamp the medical schools and faculties of engineering? The social sciences and the arts will see most of them and here the impact is likely to be dramatic, especially in the universities.

The single subject degree and the faculties and institutions built around it will feel this most. Degrees in history, literature or sociology, constructed with an intake of able 18-year-olds in mind and based on academic protégéism are likely to raise some puzzled eyebrows among the *Model E* students. They will be equipped and measured as suitable researchers will be the first aim of few of them. Moreover, while occupying the catch-all justifications for the single discipline approach—academic depth, intellectual discipline—they may well expect more.

They will almost certainly need more help in understanding and stimulating introduction to the intellectual and social relevance of a subject, rather than an extensive coverage of its terrain, or a fog exposure to its methodology. They will expect to measure the interest of one subject against another, and to acquire a range of academic expertise which is pertinent not just to their course, but also to the wide range of essentially interdisciplinary questions which they will bring to the institution from an outside world. The world is not, like sixth forms or university departments, organized around subjects.

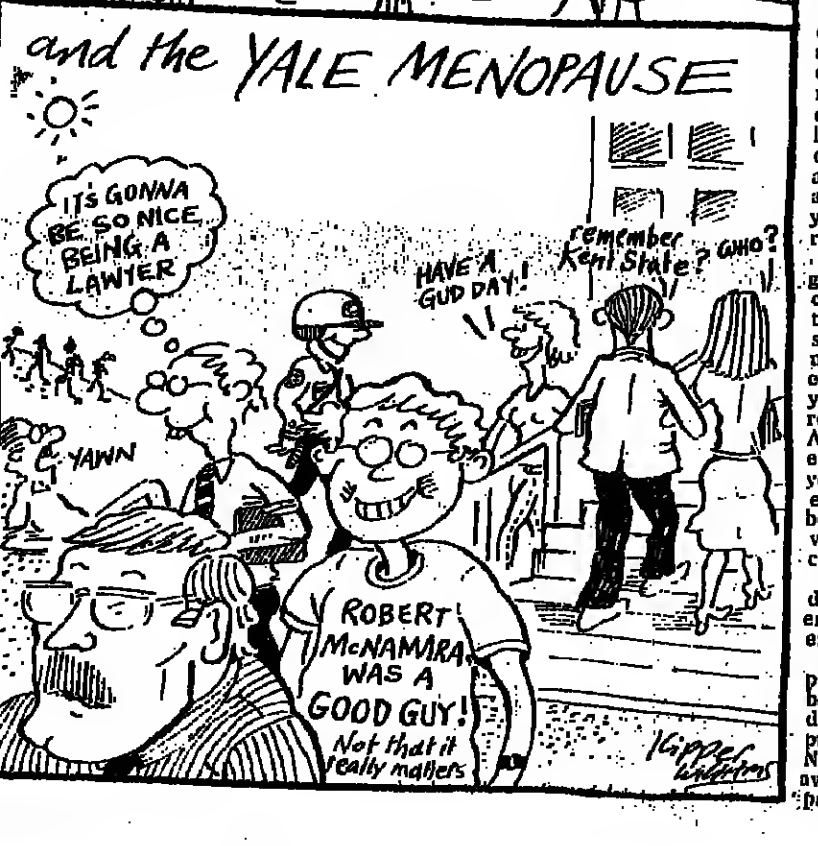
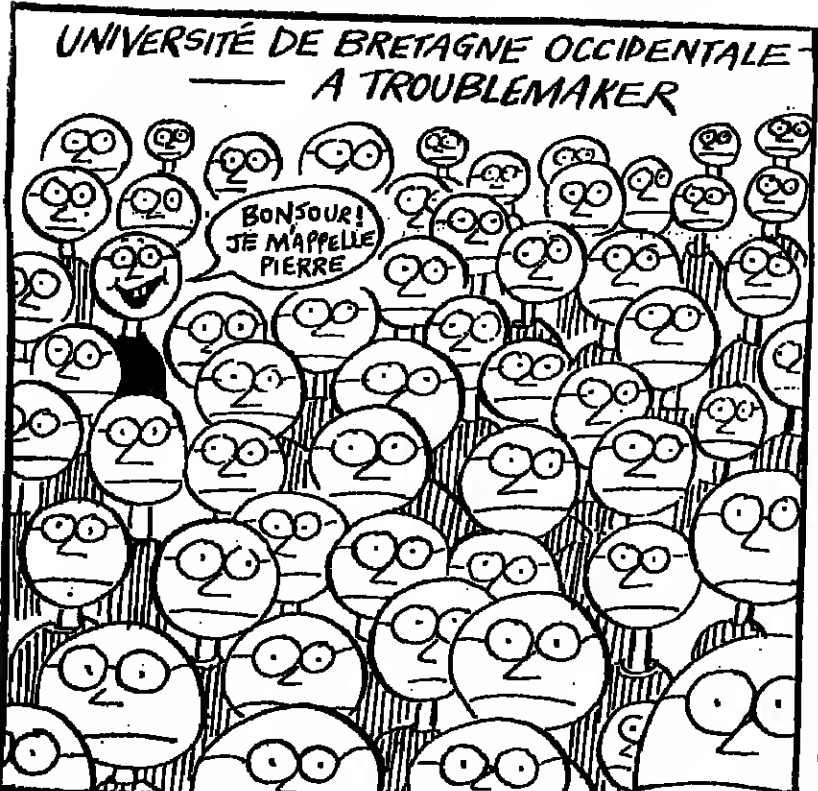
In this situation the universities will be in difficulties. These difficulties will be compounded by

others—also consequent on acts of public policy. The increasing stress on vocational education is one of these, and could well, in the arts and social sciences, raise the status of vocational institutions.

By the 1990s, in any case, public sector colleges should have significantly closed the gap in terms of staff and resources. The nature of their expertise, their greater familiarity with *Model E* type students (e.g. through HND, DipITE, and their more heterogeneous entry to degree courses); the extensive provision of part-time education; their familiarity with multi-purpose course planning; their more interactive and flexible system of academic organization; all these will give them a considerable edge.

In the end, these changes underpinned by the new mass of students will mean that the *Model E* core will probably radically weaken the binary system. A few universities will survive unscathed: the odd, relatively unambitious, research institute could open. In the great urban centres, however, where higher education will be increasingly concentrated because of the need for close contact with the polytechnic and the university is likely to merge. The only real losers in this process, apart from a few isolated colleges of higher education, will not be in the public sector, but will be those monuments to the establishment statism of the late 1950s, the geographically and politically remote "new" universities.

The author is principal lecturer in humanities at the Polytechnic of Wales.



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<p><b>ULSTER</b>  <b>THE NEW UNIVERSITY</b>  <b>SCHOOLS CULTURAL</b>  <b>STUDIES PROJECT</b>  <b>PROJECT</b>  <b>OFFICER</b></p> <p>Applications are invited from suitably qualified candidates for a two-year appointment as <b>PROJECT OFFICER</b> to the Schools</p>	<p><b>MONASH UNIVERSITY</b>  <b>Australio</b>  <b>DEPARTMENT OF INDOONESIAN</b>  <b>AND MALAY</b>  <b>TENURED</b>  <b>LECTURER</b></p> <p>Applicants should have a good knowledge of Indonesian and Malay culture, with particular reference to literature both classical and modern.</p>
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**Post level:** working as a member of a small team assuming special responsibility for research design and execution and closely connected with the project.

**Salary:** £3,883-£5,129 per annum (present range) with ESSTARS.)

**Further particulars about the post may be obtained from The Registrar, Higher Education Council, Northern Ireland BT52 1SA (quoting Ref. B76/10), to whom applications, including curriculum vitae and the names and addresses of three referees, should be sent no later than Friday, 16th September, 1978.**

**Closing date:** 16th September, 1978.



## Universities continued

## THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

## Appointment of Vice-Chancellor

The Council of the University invite applications from suitably qualified persons for the post of Vice-Chancellor of the Papua New Guinea University of Technology. The Vice-Chancellor is the chief Academic and Administrative Officer of the University. The salary is Public Service Commission level 4, at K9,785 p.a. Overseas allowances will be payable wherever applicable. The appointment will be initially for a period of three years. Candidates should preferably have a University degree together with demonstrated experience and understanding of technical processes, education or research, and considerable experience in education or research, preferably with a period as a University teacher. Experience in academic or public administration of a senior level would be an advantage.

Candidates should be able to demonstrate an understanding of, and sympathy for, the declared aspirations of Papua New Guinea for national development and a determination to achieve the University's objectives in relation to these National aspirations. Proven capacity for efficient management, and for providing leadership in a multi-cultural environment will be looked for, together with a reputation for fairness in dealings with staff, students and colleagues, and good personal relations with colleagues, subordinates, staff and students. Successful tertiary administrative and academic experience in a developing country and a personal life style in keeping with National ways of life is highly desirable with an outgoing personality and ability to mix well. It would be an advantage if the holder of the post were married with experience and willingness to entertain staff and official visitors.

Applications should include particulars of age, marital status, qualifications, experience, present position, availability and the names of referees of three referees from whom confidential enquiries may be made. Further information may be obtained on application to the Registrar of the University. The closing date for the receipt of applications is 22 September, 1978, and these should be addressed to: 1. Irving Gase, Registrar, Papua New Guinea University of Technology, PO Box 793, Lae, Papua New Guinea.

The University reserves the right to make an appointment by invitation at any stage. An additional copy of application should be sent to the Secretary General, Association of Commonwealth Universities (Appel), 36 Gordon Square, London WC1H 0PF.

## TEACHING APPOINTMENTS

## UNIVERSITY OF SINGAPORE

and

## NANYANG UNIVERSITY

Applications are invited for teaching appointments, ranging from Lectureship to Professorship in the Department of Economics and Statistics of the University of Singapore and Nanyang University. Preference will be given to candidates with postgraduate qualifications and relevant teaching/research experience in one or more of the following areas as indicated for each University. **UNIVERSITY OF SINGAPORE:** Money & Banking; Labour Economics & Industrial Relations. **NANYANG UNIVERSITY:** Microeconomics; Macroeconomics; Money & Banking; International Economics; Public Finance; Development Economics; Resources Economics; Statistical Methods; Statistical Theory; Sampling; Experimental Design; Econometrics; Applied General Statistics. Candidates should indicate the subjects in which they are competent to teach, including their areas of specialization. Gross monthly emoluments in the range S\$1,445 to S\$5,050, point of entry depending on the candidate's qualifications and experience and level of appointment offered. In addition, the University pays a 13th month annual allowance of one month's salary in December of each year. Leave, subsidized housing, medical and provident fund benefits are available. **FURTHER APPOINTMENTS, SUCCESSFUL APPLICANTS MUST BE PREPARED TO TEACH AT BOTH UNIVERSITIES.** Candidates should write to the Registrar, University of Singapore, Kent Ridge, Singapore 5, or Registrar, Nanyang University, Upper Jurong Road, Singapore 22 (as applicable) giving curriculum vitae (bim-data) with full personal particulars and also the names and addresses of three referees. Candidates should duplicate applications if they wish to apply to both Universities.

## UNIVERSITY OF WESTERN AUSTRALIA

## PERTH

## REGISTRAR

Applications are invited for appointments to the post of Registrar of the University of Western Australia. The Registrar is responsible for the University's records, including the University's official seal, and for the University's legal affairs. The Registrar is also responsible for the University's financial affairs, including the University's budget and accounts. The Registrar is also responsible for the University's administrative affairs, including the University's staff and students. The Registrar is also responsible for the University's public relations, including the University's website and press releases. The Registrar is also responsible for the University's legal affairs, including the University's contracts and litigation. The Registrar is also responsible for the University's financial affairs, including the University's budget and accounts. The Registrar is also responsible for the University's administrative affairs, including the University's staff and students. The Registrar is also responsible for the University's public relations, including the University's website and press releases.

The salary for the appointment is currently \$43,532 p.a. Further information is available from the Staffing Officer at the University of Western Australia, Perth, or from the Association of Commonwealth Universities (Appel), 36 Gordon Square, London WC1H 0PF. Applications close on 30 September, 1978.

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## Durham, Durham, Co. Durham,

## Durham, Durham, Co. Durham,

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## Durham, Durham, Co. Durham,

## Durham, Durham, Co. Durham,

## Durham, Durham, Co. Durham,

## UNIVERSITY OF GUYANA

Institute of Development Studies - Regional Monetary

## Studies Programme

## Vacancy Research Fellow

The Institute of Development Studies, University of Guyana, invites applications for the post of Research Fellow under the Regional Monetary Studies Programme. This Programme is jointly administered with the Institute of Social and Economic Research, University of the West Indies.

The successful candidate will be involved in a study of 'Financial Structure and Financial Policy' in the Caribbean. The successful candidate should have a good knowledge of both money and banking and micro-economic theory. Post-graduate training and/or research experience will be an advantage. The appointment will be for two years in the first instance. Salary Scale (per annum): UAG: \$38,000 to \$48,000.

The point of entry will be determined by qualifications and experience. The successful candidate will receive a gratuity equivalent to 20% of salary and a housing allowance of 20% of salary. Anyone recruited from overseas will receive up to four full months of leave for himself and any dependent children up to the previous year of age) from point of recruitment to Guyana, limited medical expenses and a travelling allowance.

Candidates should be able to demonstrate an understanding of, and sympathy for, the declared aspirations of Guyana for national development and a determination to achieve the University's objectives in relation to these National aspirations. Proven capacity for efficient management, and for providing leadership in a multi-cultural environment will be looked for, together with a reputation for fairness in dealings with staff, students and colleagues, and good personal relations with colleagues, subordinates, staff and students. Successful tertiary administrative and academic experience in a developing country and a personal life style in keeping with National ways of life is highly desirable with an outgoing personality and ability to mix well. It would be an advantage if the holder of the post were married with experience and willingness to entertain staff and official visitors.

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## KENYATTA UNIVERSITY

## COLLEGE

## IA (University of Nairobi)

## Applications are invited for the

## following posts:

## SENIOR LECTURER—

## BOTANY DEPARTMENT.

## Applicants must be holders of

## a PhD in Botany or an equivalent

## qualification. They must have

## teaching experience in Botany

## at the University level. The

## successful candidate will be

## responsible for the teaching of

## Botany to students on the B.Sc.

## degree course. The salary for

## this post is KSh. 10,000 per

## annum. Applications should be

## sent to the Registrar, Kenyatta

## University, Nairobi, Kenya.

## Closing date: 30 September, 1978.

## Applications should be sent to

## the Registrar, Kenyatta University,

## Nairobi, Kenya.

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## Applications should be sent to



## Polytechnics continued

ULSTER COLLEGE  
THE NORTHERN IRELAND POLYTECHNIC

Faculty of Social and Health Sciences

LECTURER II OR SENIOR LECTURER  
—PHYSIOTHERAPY

Applications are invited from suitably qualified physiotherapists to teach on both the degree and diploma courses. An appointment at the senior lecturer level would require the acceptance of a clearly defined area of responsibility over and above contribution to teaching and research. Applicants should have appropriate professional qualifications and show evidence of post-qualification development. A short-term appointment for one or two years would be considered for a suitable candidate and would allow experience to be gained in teaching and developing the first and only degree course in Physiotherapy in the United Kingdom.

LECTURER I OR II  
—DEVELOPMENTAL PSYCHOLOGY

Applications are invited for the above post. The successful applicant will contribute to the teaching of Developmental Psychology at a range of degree and non-degree courses; an interest in Psycholinguistics would be an added advantage.

Salary Scales: Senior Lecturer — £6,051-£7,065/£7,572  
Lecturer II — £4,101-£6,558  
Lecturer I — £3,192-£5,334

The Polytechnic is a direct grant institution with an independent Board of Governors. It opened in 1971 and now has a student population of some 7,100. It has extensive new purpose-built accommodation, including 750 residential places on the 114-acre campus overlooking the sea at Jordanstown, a pleasant and quiet residential area. There is a scheme of assistance with removal.

Further particulars and application forms which must be returned by October 2, may be obtained by telephoning Whitehead 10231/5533 ext. 2243 or by writing to: The Establishment Officer, Ulster College, The Northern Ireland Polytechnic, Shore Road, Newtownabbey, Co. Antrim BT37 0QB.

THE POLYTECHNIC  
HUDDERSFIELD  
SENIOR LECTURER  
APPOINTMENTS & CAREERS OFFICER

Applications are invited from persons qualified to assume the responsibilities of this post which includes careers counselling, the provision of up to date information on opportunities and liaison with external organisations. The successful candidate will be involved in other aspects of related work under the general direction of the Head.

Salary: SL25,523-£6,447 (Bar)

Further details and application forms, which should be returned by 15 September 1978, from the Establishment Officer, The Polytechnic, Queensgate, Huddersfield, HD1 3QH (Telephone 0484 22286, Ext 2226).

## PLYMOUTH POLYTECHNIC

Technical Services

TECHNICIAN  
(NAVIGATIONAL  
INSTRUMENTS)

Salary £22,887 to £32,320 (plus £212 p.a. supplement) (under review)

For the development and maintenance of electronic instruments including electronic navigation aids used for Maritime Studies. Applicants must have HNC or equivalent plus two years' appropriate experience.

Application forms to be returned by 25th September 1978, can be obtained with further particulars from the Personnel Officer, Plymouth Polytechnic, Drake Circus, Plymouth PL4 8AA.

## LIVERPOOL

THE POLYTECHNIC

DEPARTMENT OF SOCIAL STUDIES

INTERNATIONAL RELATIONS

Applications are invited from suitably qualified persons to teach on the degree and diploma courses. An appointment at the senior lecturer level would require the acceptance of a clearly defined area of responsibility over and above contribution to teaching and research. Applicants should have appropriate professional qualifications and show evidence of post-qualification development. A short-term appointment for one or two years would be considered for a suitable candidate and would allow experience to be gained in teaching and developing the first and only degree course in Physiotherapy in the United Kingdom.

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## NEWCASTLE UPON TYNE

THE POLYTECHNIC

DEPARTMENT OF HEALTH SCIENCES

LECTURER II IN NURSING

Applications are invited from suitably qualified persons to teach on the degree and diploma courses. An appointment at the senior lecturer level would require the acceptance of a clearly defined area of responsibility over and above contribution to teaching and research. Applicants should have appropriate professional qualifications and show evidence of post-qualification development. A short-term appointment for one or two years would be considered for a suitable candidate and would allow experience to be gained in teaching and developing the first and only degree course in Physiotherapy in the United Kingdom.

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LANCASTER  
THE POLYTECHNIC

FACULTY OF ART AND DESIGN

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NORTH LONDON  
THE POLYTECHNIC

FACULTY OF ART AND DESIGN

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## Research Posts

LANCASTER  
THE POLYTECHNIC

FACULTY OF APPLIED SCIENCE

APPOINTMENT OF RESEARCH ASSISTANT

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